

Malayan Fern Notes. V

by

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Dryopteris hirtipes (Bl.) O. Kuntze, Rev. Gen. Pl. 2; 813. 1891.

Basinyum: *Aspidium hirtipes* Blume, En. Pl. Jav. 148. 1828.

Synonyms: *Lastrea hirtipes* (Bl.) Moore in Beddome, Ferns of S. India, tab. xcvi. 1863-64.

Nephrodium hirtipes (Bl.) Hooker in Hk. & Bak. Syn. Fil. 261: 1883.

Malaya. Slopes of Gunong Palas, Cameron Highlands, Pahang. 23. 4. 63, ca. 1870 m. Coll. no. 4946.

This is a widespread species found from south China through Burma and north India to Ceylon, Borneo and Indonesia, and to some Polynesian islands. It does not appear to have been recorded in Malaya previously, but occurs in Siam where it bears a local name, Ta-ku-khu'i-do.

Description of living plants: Rootstock stout but flat, with tufted fronds. Scales to about 20 mm. long by 7 mm. wide at the base, tapered, midbrown with a dark base; margins entire. Scales become sparse on the upper part of the stipe, and also on the rachis where some are dark, almost black. Stipe approximately $1/3 - \frac{1}{2}$ the length of the lamina; base black for about 3 cm. then green (stramineous when dry), the base is usually densely scaly for about 5 cm. Lamina simply pinnate and to about 54 x 30 cm. or more, widest at the basal or penultimate pair of pinnae. Rachis green, grooved above and usually rounded below. About 12-15 subopposite to alternate pairs of pinnae, the basal ones on stalks 1-2.5 mm. long, gradually becoming sessile about the middle pinnae and adnate or slightly decurrent in the upper ones; apex of lamina lobed. Pinnae commonly 14 x 2.5 to 30 x 3.5 cm., ascending and widest just above the base; shallowly lobed for 1-1.5 mm.; lobes falcate especially when dry, entire with a blunt tip. Acroscopic basal lobe overlapping the rachis, but not the basioscopic one. Colour deep green and shiny above, but pale below, texture firm, thick and brittle, and pinnae glabrous except on the veins. Veins obscure, becoming visible when dry, ending just short of the margins; 4-5 veinlets in each group, sometimes 6 on the basioscopic side; very narrow hairlike brown scales scattered along the veins. Sori when immature, pale cream in colour with a whitish indusium which is persistent when mature or dry. Sori vary from one either side of the costule, to several uneven rows which are always nearer the costae than to the pinnae margins. Indusia reniform, maturing medium-brown in colour.

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The first plants found were growing on steeply sloping ground amongst tea bushes (*Camellia sinensis* Kze.) on the Sungei Palas Tea Estate. These had very small infertile fronds not more than 15 cm. long, but had very large thick rootstocks, and were probably old plants which were frequently cut back by the weeding carried out around the tea bushes, so they produced no larger fronds. The edge of the estate was a few metres from here, and was bordered by a steep and narrow forest-clad gully. In the secondary growth bordering the forest I found five more plants of the *Dryopteris* growing where the soil was loose (see plate 1). They were larger and were partly in shade, and their roots were protected by other growth. Only one fertile frond was found and this was immature. Associated plants noted besides grasses and small herbs were *Thelypteris uliginosa* (Kze.) Ching, *T. brunnea* (Wall.) Ching, *T. beddomei* (Bak.) Ching (which was very common), *Athyrium japonicum* (Thbg.) Copel., *Cyclosorus ecallosis* Holtt., tall *Cyathea contaminans* (Hk.) Copel., and the introduced *Passiflora edulis* Sims, which was scrambling all over plants at the forest edge. Just inside the forest in dark wet places, were seven more plants of *D. hirtipes*; these were smaller but were fertile, the sori being mature. No more were found in the remainder of this narrow strip of forest. On all the fertile fronds the indusia showed clearly, even when past maturity.

D. hirtipes is the only simply pinnate *Dryopteris* so far found in Malaya, the other three having much more deeply divided fronds.

Through the courtesy of the Director of the Botanic Gardens in Singapore I was able to compare the Cameron Highland material with specimens from other countries, and they were almost identical with some from Mt. Kinabalu, and very close to a sheet labelled *D. atrata* (Wall.) Ching, from the Khasi Hills in India, except that on my specimens the basal scales are larger and paler. In Beddome's description (1892) the stipe and rachis are densely scaly.

Dryopteris hirtipes (Blume) O. Ktze. var. ***exinvolucrata*** (C. B. Clarke) B. Allen comb. nov.

Synonym: *Nephrodium hirtipes* (Bl.) Hooker var. *exinvolucrata* C. B. Clarke, Journ. Linn. Soc. Bot. xxv: 93. 1889.

Malaya: In clearing in forest at filter tanks, Cameron Highlands, Pahang. 1-5-1963, ca. 1,700 m. Coll. no. 4980.

Differs from the species in having the basal scales very dark brown, almost black, and narrower (less than 3 mm. wide at the base), and being quite black at the base. Pinnae are slightly smaller and narrower the widest measured being 2 cm. wide by 10 cm. long, and the fertile fronds are slightly contracted. Lobing is very shallow and the apex of the lobes is frequently toothed. Fronds are about the same length so that the pinnae are wider apart and the acroscopic lobe does not overlap the rachis. Sori are naked, there being no sign of indusia at any stage.

This variety was collected near a stream in a small open space surrounded by tall forest, and just above where the water filter tanks are (previously the trout hatcheries). This is about two miles from where *D. hirtipes* was found. The ground was flat and rocky and had been cleared of forest before the war and periodically cut since, but a few *Cyathea contaminans* grew on the stream edges and gave slight shade. Here several plants of the variety were growing amongst plants of similar height and about 1–2 metres from the stream bank. Two other ferns were growing with them; they were small specimens of *Athyrium amplissimum* (Bak.) Holtt., and a *Cyclosorus*, possibly *C. megaphyllus* (Mett.) Ching. The *Dryopteris* bore fertile fronds at all stages of maturity, and the indusia was clearly missing.

That the species and the variety should turn up together is interesting. Also that the two localities, although not far apart and both in disturbed areas, are quite different from each other. They are large enough ferns not to be easily overlooked, and surrounding areas and similar places were searched but no more of either was found, so appear to be very restricted in their distribution. This suggests to me that they may be comparatively new arrivals in Cameron Highlands as is *Thelypteris beddomei*. (This fern was first recorded for Malaya in 1949 when I collected it from Maxwell's Hill in Perak, where tea had been grown about 50 years ago. The only other Malayan locality I know of, is at Camerons where tea is commonly grown today.) *Dryopteris hirtipes* was not growing near water, but on sloping ground both in the open and in the shade. The variety, on the other hand was near a stream on flat ground which well may be flooded, but was not found in real shade.

I saw neither in Camerons when I was there in 1948, although I collected ferns from the exact area of the variety. Nor did Dr. Holttum record them during his collecting, prior to 1949 (after that it was virtually closed for 11 years). Christensen and Holttum (1934) reported both kinds from Mt. Kinabalu area and stated (about the Lobang specimens) "H. 25557 has conspicuous indusia, but no indusia can be found on the Tenompok specimens, which thus agree with the Himalayan-Chinese *Phegopteris scottii* Bedd."

I believe that *Dryopteris scottii* (Bedd.) Ching (1933a), syn. *Phegopteris scottii* is identical with var. *exinvolucrata*, and thus would become a synonym of it. The illustration in Beddome (1892) shows almost elliptic pinnae, but he states in the text that it is "perhaps an abnormal form of *Lastrea cuspidata* or *hirtipes*". Dr. Holttum writes (in a letter to me) that the differences between *D. hirtipes* and *D. scottii* as given by Ching, agree with my description of var. *exinvolucrata*. He points out however, that after comparing many specimens of *D. hirtipes* and the variety, he finds that the toothing on the edges of the pinna-lobes is variable and does not seem to be a good distinctive character.

Dryopteris atrata is a species very closely related to *D. hirtipes* and in fact was cited as a synonym by van Alderwerelt van Rosenburgh (1908) and Backer and Posthumus (1939) but considered a variety by C. Christensen (1931) and retained as a distinct species by Ching (1938). He states that the true *D. hirtipes* occurs in south India and Siam, but not in north east India and S. China.

Microsorium superficiale (Bl.) Ching, Bull. Fan Mem. Inst. Biol. 4:299. 1933.

Basynym: *Polypodium superficiale* Blume Flor. Jav., 11: 136. 1828–29.

Synonyms: *P. normale* Don, var. *sumatranum* Bk. Journ. Bot. XVIII, 215.

P. nigricans v.A.v.R. Bull. Btz., VII: 24. 1912.

Pleopeltis superficialis (Bl.) Bedd. Handb. 350. 1885.

Pl. nigricans (v.A.v.R.) v.A.v.R. Bull. Btz. XX: 22. 1915.

Pl. rupestris var. *nigricans* v.A.v.R. VII: 24. 1912.

Distribution: From Japan and India to Indonesia.

Malaya: Slopes of Gunong Batu Brinchang, Cameron Highlands district; Pahang, altitude, 1960 m. upwards for at least 200 m. Both epiphytic and terrestrial. Coll. nos. 4024 and 4685. There appear to be no previous Malayan records.

Description. Rhizome long-creeping, dark brown, about 4 mm. wide when dry. Rhizome scales conspicuously iridescent, cell walls dark brown and forming a clear network, edges irregularly toothed, Scales spreading, overlapping, gradually tapered from a wide base to a pointed apex; apices often breaking off on old scales. Fronds well spaced on rhizome and stipes from 4 to 10 cm long or more, glabrous when mature, usually paler than the lamina. Lamina varying greatly in size according to habitat; mature fronds from 15–30 cm. long or more, by 3–5 cm. wide with tapered base and apex, usually widest just below the middle; edges slightly thickened, entire, often sinuate when dry. Fronds deep green and shiny above and paler below and glabrous. Veins indistinct but visible by transmitted light, especially the more or less parallel side veins. Sori numerous, in 3–5 irregular rows between the midrib and margin (or in 1–2 irregular to fairly regular rows between the slightly parallel veins. Sori round, but varying in size from 1.5–2.5 cm. in diameter.

In general appearance this fern resembles *M. normale* (Don) Ching, but does not have the curious scales of this species, but copious shiny scales which are most conspicuous. *M. superficiale* is in fact closer to *M. sarawakense* (Bak.) Ching, and at a distance may look like a large form of it.

I have found *M. superficiale* only in one (large) area, on the slopes of Batu Brinchang, in both disturbed and more or less intact rain forest. It seems to favour the outskirts of tall wet jungle, on both living and dead tree trunks, on horizontal logs, and on one occasion on the trunk of a *Cyathea* sp. Where it is

common, it seems to have become established on the ground around the host trees, where it produces large fronds; these I have never found fertile. In no cases were the ferns growing very near streams.

There was tall second growth, with a small rotan, probably *Calamus* sp., rather effectively sealing this area from the road. The ground was flat and damp with patches of *Athyrium dilatatum* near the terrestrial *M. superficiale* which was very common here. It was also epiphytic on the trunks of small trees and on the remains of trunks of larger cut trees, and the long thin rhizomes frequently reached the top of a stump, twisting itself around, making a conspicuous bunch of rhizomes and fronds, which hung away from the trunk.

Other ferns noted in this area included *Cyathea contaminans* (on the outside edge), *C. latebrosa*, *Cyclosorus ecallosis*, *C. stipellatus*, *Bolbitis simplicifolia*, and occasional *Athyrium subintegrum*; these were terrestrial. Epiphytic ferns were *Asplenium tenerum*, *A. nidus*, *Elaphoglossum callifolium*, *Grammitis hirtella* var. *major*, *G. reinwardtii* and one *G. holttumii* (very low on a branch of a sapling). *Xiphopteris hieronymusii* and *Ctenopteris obliquata* often grew with the *Grammitis* spp. on the mossy trunks.

Other places where the fern grew near the above habitat were on trees in tall forest on sloping ground and some others were seen in full sun on stumps; the fronds of the latter were small and pale green. It was so common here on the eastern slope of the mountain that I feel sure it must grow in similar places on other parts of the Main Range, and may even have been collected previously for it is stated to occur in Malaya by both Beddome and van Alderwerelt van Rosenburgh although no herbarium material appears to exist.

Specimens of *Microsorium superficiale* have been distributed to the following institutions: Royal Botanic Gardens, Kew; Smithsonian Institution; Chicago Natural History Museum; Gray Herbarium; Singapore Botanic Gardens; Sarawak Museum, and Swedish Museum (Nat. Hist.).

***Tectaria decurrens* (Presl) Copeland, Phil. Journ. Sci. 2C: 412 1907.**

Synonyms: *Aspidium decurrens* Presl; *A. mamillosum* C. Chr.; *A. pteropus* Kze.;

Nephrodium decurrens (Presl) Bak.; *Sagena decurrens* (Presl) Houlst.;

S. mamillosa (C. Chr.) Moore; *S. pteropus* (Kze.) Beddome. van Alderwerelt van Rosenburgh calls the Malayan form var. *mamillosum* as this seems to have the sori deeply impressed, but it is doubtful whether it is really sufficiently distinct to maintain the variety.

Known collections in Malaya: Batu Kurau, Perak. 1911; coll. G.C. Matthew. Foothills of the Main Range behind Gopeng. 1960; coll. B. Molesworth Allen nos. 4486, 4555.

Distribution: widespread from south China, N. India to Polynesia.

Holtum (1954) does not include *Tectaria decurrens* as a Malayan fern for the existence of Matthew's specimen was not then known. Admittedly Ridley (1921) does record it from Pahang, Trengganu and Perak, but it appeared there was no material in herbaria from these States. As I will show, it is a fern that is easily mistaken for two other Malayan *Tectaria* which grow in similar places. So, Dr. Holtum who was fully aware of this, being unable to find any collection from Malaya rightly omitted it from the Flora. I think now that Ridley did collect it himself from near Bujang Melaka mountain in Perak, and I believe that *T. decurrens* was far more common before the lowland jungle was greatly milled or destroyed for cultivation, for it prefers tall wet jungle, usually near streams.

It does seem strange that no other herbarium material from Malaya is known; Matthew's collection only came to light recently when Dr. Holtum was kindly examining *Tectaria* for me at Kew.

Description of the Malayan plants: Stock stout, built-up with supporting rootlets; scales dull, medium-brown, stiff, entire and tapered, commonly 10×2 mm. Stipes medium-brown to 50 or 60 cm long, commonly about 45 cm. long, and winged to within 3–4 cm. of the base, then ceasing abruptly. Wing fairly even but usually widest near the lamina, where it may be over 3 cm. (across both wings) on sterile fronds. Scales are present only on the base of the stipe, the underside being glabrous for the remainder (it is always scaly in *T. vasta*). Fronds erect, glabrous medium-green and shiny above, drying olive brown. Lamina, simple when very young; adult deeply lobed with 3–4 pairs of lobes and a basal pair which often have a lobe each. Apex large, usually with a pair of small lobes at the base. Lamina length commonly about 45–55 cm. long and about as wide (across the lobes) as long. Fertile fronds slightly contracted; the upper 16 cm. of the wing of the stipe bearing scattered sori. Sori similar to that of *T. crenata* on a receptacle, very deeply impressed so that the upper surface of the lamina is strongly papilliform. Sori placed on free terminal veins within aeroles in two, more or less even rows, between the costules. Indusium large, reniform and persistent.

When I first saw *T. decurrens* in Malaya (and I was familiar with it in Borneo) in July 1959, it was sterile, and I noted that it was possibly young *T. vasta*. Later, however, in August I found a fertile plant in the same area and not expecting *T. decurrens*. I was careless enough to pass it off as *T. crenata*, but did not collect it then, only adding that the stipe was winged to its base as in *T. vasta*. I mention this to illustrate how easy it is to mistake this fern, and if records are not backed by herbarium material, they should be treated with caution.

Tectaria decurrens was growing on the floor of tall mixed jungle, which lies in the foothills of the Main Range between Gopeng and Jor Camp. The forest here has remained more or less intact as it is a water catchment reserve. Next to a large *Pteridys* sp., it was the commonest fern within an area of about 30 square metres, at an altitude of about 100 m., and higher up in the continuation of the forest, it became rare and was not seen above 300 m. The ground where it was common was generally sloping, but with a flat area just above a rocky stream. The soil was black and sticky, the undergrowth fairly sparse, and in a few places some trees had fallen and exposed a few *Tectaria* to direct sun. These seemed to be surviving when I last saw them (1963), but were continually fertile whereas the others in shaded places, in what is probably their natural habitat, produced new growth in December and January, and sori from January to April. During August—September only sterile plants, or those with very old sori were noted.

Associated floor plants included *Tectaria maingayi* which was very common, a very large form of *Pteridys* which approached *acutissima*, as well as normal *P. australis* (which was not very common here), *Tacca cristata* and several small ginger, *Globba auranticea* and *G. variabilis*, and large ones, *Achasma* sp. and *Hornstedtia* sp.; *Forrestia* sp., *Curculigo latifolia*, *Angiopteris evecta*, and some dwarf palms including *Pinanga* (probably *disticha*), and some aroids *Anadendrum* sp. and *Schismatoglottis* sp. in the dryer parts, also *Tectaria singaporeana* on sloping ground. Juvenile *Lomariopsis cochinchinensis* was frequent at tree bases, and taller growth in this area included *Cyathea latebrosa*, *Baccaurea lanceolata* and *B. brevipes*. Growing in and on the sides of the stream were noted, *Saraca thaipingensis*, *Salmalia valetonii* and a huge Annonaceous tree in the stream with large cauliferous flowers borne low on the trunk, and *Laportea stimulans*; on wet rocks were *Bolbitis diversifolia* which was very common. *B. heteroclita*, *Egenolfia appendiculata* and a possible hybrid between two of these; *Microsorium pteropus*, *Abacopteris meniscii-carpa*, *Trichomanes maximum* and one *Athyrium simplicivenium* (which commonly occurred higher up), *Stauroanthera grandiflora*, and a *Begonia* sp. which was very common. On large rocks by the stream were *Polypodium papillosum* and *Phymatodes nigrescens*. Lianes were common over the stream, one was a *Vitis* sp. others were *Calamus* spp.

The only other place I have seen the fern in Malaya was at Klian Intan in Upper Perak. It was growing on the floor of tall rather similar forest at about 300 m. There was scant undergrowth on flat ground near a stream. Again, the *Tectaria* was found in only one small area, but as I did not collect it then (intending to return later), I can only make a note of it in here.

Cyclosorus papilio (Hope) Ching, Bull. Fan Mem. Inst. Biol. 8:214. 1938 syn. *Nephrodium papilio* Hope, Journ. Bombay Nat. Hist. Soc. 12: 625 t. 12.1899.

Distribution: N. India, Ceylon.

In 1958 I found *C. papilio* on the borders of Pahang and Perak, by the side of a small stream under tall trees, growing alongside some large gingers (*Achasma macrocheilos*). This was just below Ringlet at about 1,000 m. It was identified by Dr. Holttum. Later I found it in several areas lower down, on the same part of the Main Range, where in places it is quite common. The second area was all within the Tapah Hills Forest Reserve, from about 670–1,000 m. in altitude. Coll. nos. 3913, 3986, 4312, 4449, 4949.

In the past *C. papilio* was included under *Nephrodium molle* var. *major* Bedd. (as was *C. sumatranus* (v.A.v.R.) Ching). Then the specimens from north India and Ceylon were removed by Hope and called *N. papilio* (see Holttum (1954) p. 275).

Extreme forms of the Malayan species do appear to be quite distinct, especially in the remarkable auricles on the stipes (always about 5 or 6 pairs) which have such enlarged and pointed acroscopic lobes that they resemble the Malayan Dragontail butterfly (*Lamproptera megas virescens*), thus the specific name is most apt. There are oblong glands on the underside of the lamina, sometimes copious, which I have not seen on *C. sumatranus*. There are, however, specimens which I consider are intermediate between the latter and *C. papilio*. I have found *C. sumatranus* growing together with *C. papilio* at about 700 m. which is a high altitude for this normally lowland fern.

I have not yet seen any other specimens of *C. papilio* with which to compare mine. If this species has already been collected in Malaya, it will most probably be found under *C. sumatranus*, for there appear to be no other records of it.

I am grateful to the Director of the Royal Botanic Gardens, Kew, for assistance in checking specimens and to Dr. R. E. Holttum who has spent much of his valuable time on my behalf checking my identifications, and especially for the information on the status of *Dryopteris hirtipes* and the var. *exinvolucrata*.

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1. *Dryopteris hirtipes* on forest edge, Cameron Highlands. Pahang.



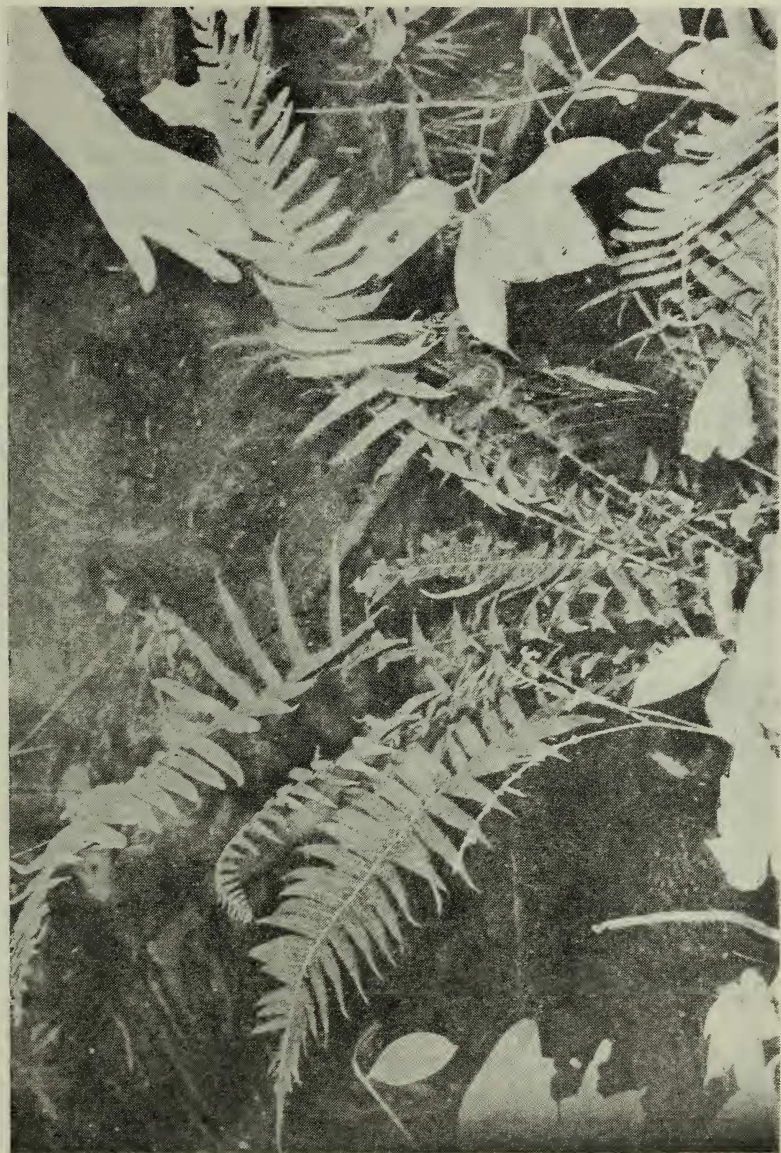
2. *Microsorium superficiale* from the slopes of Batu Brinchang. Pahang.



3. *Tectaria decurrens* growing in forest near Gopeng. Perak.



4. *Tectaria decurrens*; a fertile frond showing the deeply immersed sori.



5. *Cyclosorus papilio*, Tapah Hills forest, Perak.